

Notice of Allowability

Application No.

09/598,406

Examiner

Audrey Y. Chang

Applicant(s)

HOPPEN, GERHARD

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Appeal Brief November 17, 2004.
2. ☒ The allowed claim(s) is/are 1-20, 21, and 24-28 renumbered as 1-26.
3. ☒ The drawings filed on 21 June 2000 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

Remark

- This Office Action is in response to applicant's appeal brief filed on November 17, 2004, which has been entered into the file.
- Claims 1-20, 22, and 24-28 remain pending in this application.

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Glenn Law (Reg. No. 34, 371) on July 8, 2005.

The application has been amended as follows:

In the claims: Claims 1, 19, 22 and 24 are amended as follows

1. (Currently Amended) A DUV-capable microscope objective, comprising:

a plurality of lens elements, on an object side, to generate convergent light;

a penultimate lens element which receives the convergent light from the plurality of lens elements; and

a further lens element, on an image side, which receives light from the penultimate lens element;

wherein

the plurality of lens elements ~~and the penultimate lens element~~ and the further lens element are made of quartz glass and fluorite and the penultimate lens element is made either of quartz glass and fluorite or of quartz glass and lithium fluoride,

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the objective has a DUV focus at a DUV wavelength λ_{DUV} , wherein λ_{DUV} is one wavelength in the deep ultraviolet region between 200 nm and 300 nm,

the objective has an IR focus for an IR wavelength λ_{IR} , wherein λ_{IR} is one wavelength in the infrared region greater than or equal to 760 nm, at the same focal point as the DUV focus at λ_{DUV} , and

the penultimate lens element comprises a concave configuration on both sides, wherein an object-side ~~outer~~ radius of curvature of the penultimate lens element is smaller than its image-side ~~outer~~ radius of curvature.

19. (Currently Amended) A DUV-capable microscope, comprising:

an objective comprising a plurality of lens elements, on an object side, to generate convergent light; a penultimate lens element which receives the convergent light from the plurality of lens elements; and a further lens element, on an image side, which receives light from the penultimate lens element, wherein the objective has a DUV focus at a DUV wavelength λ_{DUV} , wherein λ_{DUV} is one wavelength in the deep ultraviolet region between 200 nm and 300 nm, wherein the objective has an IR focus for an IR wavelength λ_{IR} , wherein λ_{IR} is one wavelength in the infrared region greater than or equal to 760 nm, at the same focal point as the DUV focus at λ_{DUV} , and wherein the penultimate lens element comprises a concave configuration on both sides, the plurality of lens elements and the further lens element are made of quartz glass and fluorite and the penultimate lens element is made either of quartz glass and fluorite or of quartz glass and lithium fluoride, and wherein an object-side ~~outer~~ radius of curvature of the penultimate lens element is smaller than its image-side ~~outer~~ radius of curvature; and

an IR laser autofocus system in optical communication with the objective to provide light at the IR wavelength λ_{IR} and auto-focusing.

22. (Currently Amended) A microscope objective, comprising:

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a converging first lens disposed closest to an object being imaged;

a converging second lens disposed along an optical axis after the first lens;

a first doublet lens disposed along the optical axis after the second lens;

a first triplet lens disposed along the optical axis after the first doublet lens;

a second triplet lens disposed along the optical axis after the first triplet lens;

a converging lens group comprising one or more lenses disposed along the optical axis after the second triplet lens;

a diverging penultimate lens comprising concave outer sides, wherein an object-side ~~outer~~ radius of curvature is smaller than an image-side ~~outer~~ radius of curvature disposed along the optical axis after the converging lens group; and

a diverging doublet lens disposed after the penultimate lens,

wherein the objective has a focal length of 1.6 mm or less at a DUV wavelength λ_{DUV} , wherein λ_{DUV} is one wavelength in the deep ultraviolet region between 200 nm and 300 nm, and at an IR wavelength λ_{IR} , wherein λ_{IR} is one wavelength in the infrared region greater than or equal to 760 nm, wherein the lenses other than the penultimate lens are made of quartz glass and fluorite and the penultimate lens is made either of quartz glass and fluorite or of quartz glass and lithium fluoride, and wherein a numerical aperture of the objective is at least 0.8.

24. (Currently Amended) A DUV-capable microscope, comprising:

an objective comprising a plurality of lens elements, on an object side, to generate convergent light; a penultimate lens element which receives the convergent light from the plurality of lens elements; and a further lens element, on an image side, which receives light from the penultimate lens element; wherein

the objective has a DUV focus at a DUV wavelength,

the objective has an IR focus for an IR wavelength at the same focal point as the DUV focus, and

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the penultimate lens element comprises a concave configuration on both sides, wherein an object-side ~~outer~~ radius of curvature of the penultimate lens element is smaller than its image-side ~~outer~~ radius of curvature, and

the penultimate lens element is made either of quartz glass and fluorite or of quartz glass and lithium fluoride.

Reasons For Allowance

2. The following is an examiner's statement of reasons for allowance: in view of the arguments presented in the appeal brief, none of the prior art references considered has disclosed a DUV-capable microscope objective that is comprised of a plurality of lens element, made of either of *quartz glass and fluorite* and a *penultimate lens element* that is made either of *quartz glass and fluorite* or *quartz glass and lithium fluoride*, such that the objective has a DUV focus at a wavelength between 200 nm and 300 nm and a IR focus at wavelength greater than 760 nm and the *focal point is the same* for both focus. The penultimate lens element has *concave* configuration on both side with the *object-side radius of curvature is smaller* than the *image-side radius of curvature*.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

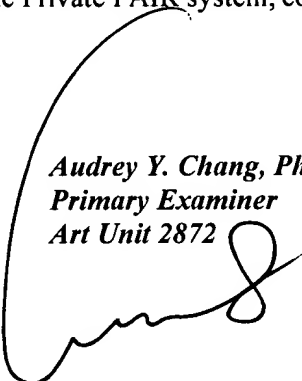
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang, Ph.D.
Primary Examiner
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A. Chang, Ph.D.